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United States Patent [19]**Tashiro et al.**[11] **Patent Number:** **5,556,583**[45] **Date of Patent:** **Sep. 17, 1996**[54] **ENCAPSULATION METHOD**[75] Inventors: **Nansei Tashiro**, Sodegaura-machi,
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Tokyo, Japan[21] Appl. No.: **190,586**[22] Filed: **Feb. 2, 1994****Related U.S. Application Data**

[63] Continuation of Ser. No. 677,185, Mar. 29, 1991, abandoned.

[51] **Int. Cl.⁶** **B01J 13/02**[52] **U.S. Cl.** **264/4.1; 106/22 C; 427/213.3;**
427/213.31; 427/213.33; 427/213.34; 427/213.36;
428/402.21; 428/402.22; 428/402.24; 430/138[58] **Field of Search** 264/4.1, 4.3, 4.32,
264/4.33, 4.6, 4.7; 427/213.3, 213.31, 213.33,
213.34, 213.36; 428/402.21, 402.22, 402.24;
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0064967 11/1982 European Pat. Off. .
3008658 9/1980 Germany .*Primary Examiner*—Richard D. Lovering*Attorney, Agent, or Firm*—Armstrong, Westerman, Hattori,
McLeland & Naughton[57] **ABSTRACT**

An encapsulation method applicable to pharmaceutical preparations, cosmetics, pigment imparting materials such as inks, paints, dyes, electrostatic toner, and others is disclosed, as are methods of use thereof. According to the disclosed method, the use of auxiliary materials such as emulsifiers or surfactants can be dispensed with, and ultra-microcapsules having a readily controllable diameter of 1 μ m and less can be produced. The disclosed method includes the steps of preparing an organic phase consisting of a mixture of one or more hydrophobic liquid and/or solid materials and self dispersible resin which through the action of an aqueous phase, self disperses into particles with a diameter of 0.1 μ m and less; combining an aqueous phase with the organic phase, whereby self emulsification takes place, thereby encapsulating the one or more hydrophobic liquid and/or solid materials.

2 Claims, 2 Drawing Sheets